information unless you have something else that you specifically wanted to put on there later. Listening to the voice quality - it sounds real good. We're coming up on a midcourse 4 and right now it's - talking about doing it on time, and you can anticipate the burn in the neighborhood of 3 foot per second. We're considering and would like for you to think about the possibility of doing this burn using the onboard vector and just have us update the vector in the LM slot, so that you will have the MSFN vector on board. But it looks like it won't have any big effect on the burn results, and it might prove interesting. So if you think about that one for a bit and let us know if you have any suggestions or thoughts on the subject.

02 09 28 39	LMP	Roger. You say it uses the onboard vectors and leaves the MSFN vectors on the LM slot.
02 09 29 45	CC	That's affirmed, if that's what you would like to do, right. We considered it, and it looks like that would be a reasonable thing.
02 09 29 55	LMP	Roger. Frank and Jim are asleep now, and I'll bring this up to them when they wake up.
02 09 30 03	CC	Okay. Real fine.
02 09 30 48	CC	Apollo 8, Houston. How about stirring up the oxygen?

02 09 30 56	LMP	Okay. Stand by.
02 10 06 38	CC	Apollo 8, Houston.
02 10 06 43	LMP	Go ahead, Houston.
02 10 06 45	CC	Okay, Bill. I guess I want to belay my last about using the onboard state vector for MCC 4. After looking at it some more on the ground, they've got to get going on making the PAD's and doing all their computations, and rather than put it off or do it twice, we're going to go ahead and go with the procedures we've been using all along. On the lunar orbit stuff, we've been looking it over and we got several guys - Jack Schmitt and company in the back room - looking at what effect your windows have. And, basically, it looks like there's two options that will make an impact on that REV 2. One of the options, of course, will be just to have you and Jim change seats and let Jim look out and get his SAM that way, and another option will be to roll the bird over and let Jim point the optics as far forward as he can get them and take his SAM through the telescope. And I guess we'd like to have any thoughts that you folks have on what you think you can do with the windows; if you have anything, we'd like to factor it into our thinking and go ahead and firm up

our plans as early as we can. We'd like not to put it off so that we have none of these things to do after midcourse. You folks can probably tell us more about what you can do with those windows. So if you have any thoughts, go ahead and sing out with them, and we'll see what we can do about factoring that in.

02 10 08 25 LMP Okay. With reference to the midcourse, I think that's generally agreed upon, that we do it like we've always been doing it. Now, with respect to the windows, center windows, essentially, are usable. The two side windows are - may be all right for observation, and the problem with the rendezvous windows is that they're pretty small. And I just thought we'd have to play the window game by ear almost. Not really sure what capability we're going to have. And we'll give you some more thoughts on this later.

02 10 09 02 CC Okay. How about exercising the idea of rolling over and having Jim do his polarization through the telescope because if we have to change attitudes we'd like to go ahead and start thinking about what effects that'll have on such things as antenna orientation and all that.

02 10 09 24 LMP Okay. We'll, I'll mention it to them when they wake up.

END OF TAPE

APOLLO 8 AIR-TO-GROUND VOICE TRANSCRIPTION

(GOSS NET 1)

02 10 30 34	CC	Apollo 8, Houston.
02 10 30 40	LMP	Go ahead, Houston.
02 10 30 42	CC	Okay. Apollo 8, we'd like to update your CMC clock. This is not the correct errors which we have now but just to make up for some effects that we're going to have in lunar orbit. And what we'd like to have you do is go to POO and ACCEPT and let us update the clock time.
02 10 31 04	LMP	Stand by.
02 10 31 23	LMP	Okay. You got POO and ACCEPT.
02 10 31 25	CC	Roger. Thank you.
02 10 38 07	CC	Apollo 8, Houston.
02 10 38 13	LMP	Go ahead, Houston.
02 10 38 14	CC	Okay. We're completed with the clock update, and the computer is yours.
02 10 38 21	LMP	Roger. Going to BLOCK.
02 10 38 28	CC	Roger.
02 10 49 50	CC	Apollo 8, Houston.
02 10 49 56	LMP	Go ahead, Houston.
02 10 49 58	CC	How about an O_2 purge?
02 10 50 04	LMP	Okay.
02 10 50 07	CC	Thank you.
02 10 51 26	LMP	There's number 1.
02 10 51 30	CC	Roger.
02 11 42 19	CC	Apollo 8, Houston.
02 11 42 24	LMP	Houston, Apollo 8. Go ahead.

02 11 42 26 CC . Okay. We'd like to update CMC. The order that we'll update will be the LM state vector, the CSM state vector, and then the external DELTA-V and the REFSMMAT. So any time you're free with it, we can have POO in ACCEPT; we'll go ahead with it.

02 11 42 53 LMP I understand you're going to update LM state vector, CSM state vector, and external DELTA-V and the REFSMMAT.

02 11 43 00 CC Affirmative. And I'll have one, two, three PAD's to read to you.

02 11 43 12 LMP Stand by. Okay. You've got POO in ACCEPT.

02 11 43 18 CC Okay, thank you. And just a minute, I'll be with you on the PAD's. They'll be three minute maneuver PAD's, one of them MCC 4.

02 11 45 19 LMP Houston, this is Apollo 8. We're ready to copy if you read.

02 11 45 22 CC Okay. Stand by.

02 11 45 27 LMP Okay. I thought maybe we had lost COMM here for a second.

02 11 45 31 CC No, I'm just behind.

02 11 46 26 CC Okay. Apollo 8, let me just read you midcourse correction number 4.

02 11 46 38 LMP Okay.

02 11 46 42 CC Alright. Midcourse correction number 4: the RCS/G&N 628 88 November Alfa November Alfa 06059 5430 minus 00012, minus 00011, plus 00012 031

008 323 November Alfa, plus 00618 00020 011 00020 1729 65308 Alpha-Centauri, up 073, left 34. For the stars, it will be the primary Sirius, secondary Rigel, 129 155 010. Over.

02 11 49 25 LMP Roger. MCC 4, RCS/G&N 6288 NA, NA 06059 5430, minus 00012, minus 00011, plus 00012 031 008 323, NA. Are you with me so far?

02 11 50 02 CC Keep going.

02 11 50 06 LMP Plus 00618 00020 011 00020 1729 65308 Alpha-Centauri, up 073, left 34, primary Sirius, secondary Rigel 129 155 010. Over.

02 11 50 48 CC That's correct, Apollo 8.

02 11 51 05 LMP And what else have you got?

02 11 51 07 CC Okay. I've got one for pericynthian plus 2, and it's a minimum DELTA-V solution.

02 11 51 24 LMP Roger. Ready to copy.

02 11 51 29 CC Okay. That's pericynthian plus 2, RCS/G&N 628 71 November Alfa, and stand by one. Okay. We'll pick up with a pitch trim and yaw trim of not applicable; time 07107 2216, minus 00468, plus 00254, plus 00161 173 101 027 November Alfa plus 00187 00563 515 00563 013169 198 044, down 044, left 45, plus 1100, minus 02500 12967 36193 1370153, primary Sirius, secondary Rigel 129 155 010, four jets plus X. This assumes execution of midcourse correction number 4 and

		uses the same alignment as midcourse correction 4. Over.
02 11 54 33	LMP	Roger. Pericynthian plus 2, minimum DELTA-V RCS/G&N 62871, NA, NA, 07107 2216, minus 00468, plus 00254, plus 00181 173 101 027, NA, plus 00187 00563 515 00563 013169 198 044, down 044, left 45, plus 1100, minus 02500 12967 36198 1370153, primary Sirius, secondary Rigel, 129 155 010, four jets plus X, assumes MCC 4 with same alignment. Over.
02 11 56 10	CC	That is correct, Apollo 8.
02 11 56 28	LMP	Houston, Apollo 8. Confirm that boresight star and SPA are exactly the same number and not typographical error.
02 11 56 47	CC	Roger, Apollo 8. They are checking that. Apollo 8, the computer is yours. You can take it back.
02 11 57 00	LMP	Roger. Going to BLOCK.
02 11 57 02	CC	Thank you.
02 11 59 06	CC	Apollo 8, Houston.
02 11 59 26	CC	Apollo 8, Houston.
02 11 59 35	LMP	Houston, this is Apollo 8. Do you copy?
02 11 59 37	CC	I do now loud and clear. I've got one more PAD for you, and the confirmation that those boresight star number and the pitch angle are correct at 44.
02 11 59 54	CC	Roger. And we are ready to do our P52 preferred alignment at this time. Are you ready?

02 12 00 02	CC	Affirmative.
02 12 00 14	LMP	Okay. We are ready to copy.
02 12 00 17	CC	Okay. This is a pericynthian plus 2 for a fast return. This will be SPS/G&N 62871, minus 161, plus 129 071 064207, plus 45224, minus 06216, minus 18712 001 287351, November Alfa plus 00187 49336 60349 118 112038 296, earth up 010, right 37, plus 1475, plus 06500 13239 369 131060 923, primary star Sirius, secondary Rigel 129 155010, no ullage, assumes execution of midcourse correction 4 and uses the same alignment. The time for MCC 5 for GERU determination - that's Golf Echo Romeo Uniform - this will be a GET of 83:02; use P37 NC-4, steps 1 through 10 and NC-8 steps 3 and 4. I say again, use P37 November Charlie 4 steps 1 through 10 and November Charlie steps 3 and 4; velocity 400K for corridor control chart 36507. Over.
02 12 04 26	LMP	Houston, Roger. This is Apollo 8. You copy?
02 12 04 32	CC	This is Houston. No joy.
02 12 04 40	LMP	Roger, Houston. This is Apollo. How you read?
02 12 04 42	CC	Okay. Loud and clear, Bill.

END OF TAPE

APOLLO 8 AIR-TO-GROUND VOICE TRANSCRIPTION

(GOSS NET 1)

02 12 04 47	LMP	Okay, Ken. Pericynthian plus 2, fast return SPS/G&N 62871, minus 161, plus 129 071 064207, plus 45224, minus 06216, minus 18712 001 28 603 49 118 11 2038 296 earth up 010, right 37, plus 1475, plus 06400 1323 936 913 1060 923, primary Sirius, secondary Rigel 129 155 010, no ullage, assume MCC 4 same alignment, MCC 5 GERU determination GET 83:02 P37 NC-4 0 through 10 and copy NC-8, 3, and 4. Velocity at 400K 36507. Over.
02 12 07 10	CC	Okay, Apollo 8. That's correct with one exception: in the PAD format under longitude NOUN 61, that is plus 06500. Over.
02 12 07 31	LMP	Roger. That's what I have, plus 06500.
02 12 07 38	CC	Okay. That's correct, Apollo 8
02 12 07 52	LMP	And we're ready to copy whatever else you have.
02 12 08 03	CC	Apollo 8, let's go back and confirm on your minimum DELTA-V pericynthian plus 2 that the pitch column is 101; that's the fifth block down.
02 12 08 19	LMP	Roger. Pitch. Roger, pitch 101.
02 12 08 25	CC	Okay. Thank you very much. And the item we have left to go is that we'd like to get with you on how you want to handle the problem with windows on REV 2.
02 12 09 59	LMP	Okay, Houston. Stand by on that, please.
02 12 09 01	CC	Roger.

02 12 09 02	LMP	Houston, this is Apollo 8. We want you to come up with a suggested redline for RCS usage during lunar orbit, also, please.
02 12 09 12	CC	Roger. That's in work.
02 12 09 21	LMP	And for your information, Houston, when the sun is shining on window 5, it's pretty hazy; window number 1 is a little bit better.
02 12 09 34	CC	Okay. Thank you.
02 12 10 10	LMP	Houston, this is Apollo 8.
02 12 10 20	LMP	Houston, Apollo 8.
02 12 10 23	CC	Apollo 8, go ahead.
02 12 10 26	LMP	Roger. We tried to get this realignment. We need - Do you have a maneuver to get us some gimbal angles so we don't get gimbal lock when we get the preferred alignment?
02 12 10 41	CC	Stand by on that.
02 12 10 45	LMP	Thank you.
02 12 10 49	CMP	Houston, on our present position, we'll go into gimbal lock. I figure to try and get the preferred angle.
02 12 10 57	CC	Say again, Apollo 8.
02 12 11 01	CMP	In running through PROGRAM 52, we got a PROGRAM ALARM 401 which would indicate that if we continued, we'd drive it into gimbal lock.
02 12 11 12	CC	Roger. I understand.
02 12 12 11	CC	Apollo 8, Houston. This should be an OPTION 1 like OPTION 3.

02 12 12 23	CMP	Houston, we're doing an OPTION 1 like OPTION 3. We keep getting a 401 ALARM, which says desired RCTU yields gimbal lock.
02 12 12 34	CC	Roger. Stand by.
02 12 19 14	CC	Apollo 8, Houston. It appears that you have maneuvered around the gimbal locks system.
02 12 19 22	CDR	Roger. Roger.
02 12 19 25	CC	Okay. Sorry we were late on that answer.
02 12 19 30	CDR	Thank you.
02 12 21 20	CMP	Houston, Apollo 8.
02 12 21 22	CC	Go ahead.
02 12 21 26	CMP	Well, we stopped and went through coarse align of P52 and then we got fine align, and pick-a-pair, pick Capella, but she drove and didn't get to any place. I didn't pick Capella, and I can't recognize any out there right now. Can I re-cycle here and go back and pick a pair?
02 12 21 54	CC	That's affirmative, Apollo 8.
02 12 25 27	CMP	Houston, Apollo 8.
02 12 25 30	CC	Go ahead, Apollo 8.
02 12 25 33	CMP	My plan is to go back into re-enter PROGRAM 52 - well, it did not drive to Capella, and I can't recognize it in the scanning telescope. My plan is to go back into recall P52.
02 12 25 50	CC	Okay. Stand by one.
02 12 25 54	CC	Apollo 8, can you confirm that you zeroed the optics prior to starting?

02 12 26 02	CMP	Roger. That's affirmative. We zeroed the objects.
02 12 26 32	CC	Apollo 8, Houston. You have a GO for a second try in P52 with an OPTION 3.
02 12 26 43	CMP	Okay. I now have Aldebaran in the scanning telescope; I might want to call that one instead of Capella.
02 12 26 50	CC	Okay.
02 12 26 51	CMP	I'll see what it comes up with first, though.
02 12 32 23	CDR	Houston, Apollo 8. We came up with an unacceptable difference in our stars; we're going to have to recycle.
02 12 32 29	CC	Roger.
02 12 32 33	CDR	If we don't get this midcourse in, what will that do to our pericynthian?
02 12 32 40	CC	Stand by. We'll -
02 12 32 57	CC	Apollo 8, Houston. In the event that we don't get this midcourse in, we'll still go for an LOI, and it's been suggested you might try Mirfak which is OCTO 10.
02 12 33 12	CDR	That's the one we're trying now.
02 12 33 13	CC	Roger.
02 12 51 50	CDR	Houston, Apollo 8.
02 12 51 52	CC	Go ahead.
02 12 51 56	CDR	We are all set up and counting down at 8 minutes.
02 12 52 00	CC	Roger.

02 12 52 08	CC	Apollo 8, our data is down right now; eppreciate making sure you have the tape recorder on.
02 12 52 19	CDR	Roger. I am going to go - I'll have to go COMMAND RESET. You've got control.
02 12 53 52	CDR	Houston, Apollo 8.
02 12 53 57	CC	Go ahead.
02 12 54 00	CDR	Roger. You have some pitch and yaw angles for our PTC extra burn.
02 12 54 14	CC	Okay, Apollo 8. That's pitch 348, yaw 315.
02 12 54 25	CDR	Pitch 348, yaw 315.
02 12 54 30	CC	That's affirmative. And would you give us another hack on your countdown time?
02 12 54 39	CDR	It's 518 17 16 15 14.
02 12 54 45	CC	Thank you.
02 12 55 51	CDR	Houston, I will give you a mark in 4 minutes.
02 12 55 53	CC	Alright. Thank you.
02 12 55 54	CDR	3, 2, 1 -
02 12 55 57	CDR	MARK.
02 12 55 58	CDR	Four minutes.
02 12 57 05	CC	Apollo 8, Houston. How about switching the BIOMED switch over to the left.
02 12 57 12	CDR	Roger. 3, 2, 1 -
02 12 57 16	CDR	MARK.
02 12 57 18	CDR	Switched.
02 13 01 02	CMP	Houston, Apollo 8.
02 13 01 05	CC	Go ahead.

02 13 01 08	CMP	Roger. Burn on time, angles nominal, burn time about 12 seconds, 0.2 feet per second after the DELTA-V_C, 0 in VG_X. We have transferred the results of the burn over to the left slot VERB 66.
02 13 01 30	CC	Roger. And got a couple of items that I would like to clean up. We will get you an RCS budget. We've got one redline now; we are trying to get some firmer numbers for you, and we will have those in a little bit. Right now your PTC usage is right on the flight plan line, so everything looks pretty good there. We want to get a crew status report from you. We would like to firm up the REV 2 flight plan idea; and sometime at your convenience, we would like to take a reading of the PRD for the commander and CMP and then have you swap them. We are trying to isolate the -- what the possible reason is for the discrepancies or the disparity in the two readings.
02 13 02 29	CMP	Roger.
02 13 02 58	CMP	And we are maneuvering to the PTC attitude, Houston.
02 13 03 01	CC	Roger.
02 13 05 17	CC	Apollo 8, Houston. Could you give us the sign of that Z residual?
02 13 05 40	CMP	Stand by, Houston. Alright, Houston. Looks like we didn't record just the Z. We recorded DELTA V_C, which is minus 0.2.

02 13 06 16	CC	Okay. Understand.
02 13 06 17	CMP	DELTA-V was 0.1, but we didn't get the sign.
02 13 06 24	CC	Roger. Understand that was DELTA-V_C was minus 0.2. I copied DELTA-V_Z; ZULU is 0.2. Is that incorrect?
02 13 06 39	CMP	Roger. It was 0.1, but we didn't get the sign.
02 13 06 44	CC	Okay. Thank you.
02 13 06 46	LMP	We can get it. We have it on the tape, Houston, whenever you want to dump it.
02 13 06 54	CC	Roger. Thank you.
02 13 06 57	LMP	It'll be about the last 5 minutes worth.
02 13 07 00	CC	Roger.
02 13 07 59	LMP	Okay, Houston, for the PRD's: CDR is 0.07, CMP is 0.64, LMP is 0.80. Note that the CMP's hasn't changed since we started and the commander's hasn't changed much. We have swapped PRD's; commander has LMP, CMP has commander's, and LMP has CMP's PRD. Over.
02 13 08 27	CC	Okay. Thank you.
02 13 09 53	CMP	Houston, Apollo 8.
02 13 09 57	CC	Go ahead.
02 13 10 01	CMP	Roger. Crew status report as follows: water, the commander has about 50 clicks so far today; CMP 43; and the LMP is 44. We've eaten two meals so far today. Day 3 meal A and B; consumed most of it except for the hard hard bite, which no one

cares for. Pudding was outstanding. We're at a gain of pericynthian now of plus 63 miles. Commander and CMP have had a rest period just before the midcourse 4 of about 2 hours.

Start GDS DUMP 61:12

02 13 11 07	CC	Roger.
02 13 16 11	CMP	Houston, Apollo 8.
02 13 16 13	CC	Go ahead.
02 13 16 18	CMP	We're at a gain of about 20 500 miles from the moon at 61:14. How does that agree with what you figure?
02 13 19 18	CC	Apollo 8, Houston. Looks like you're on the secondary loop. We would like to run that for about 5 minutes.
02 13 19 28	CDR	Roger. We're doing the ECS redundant component check.
02 13 19 31	CC	Roger. We'll follow.
02 13 19 32	CDR	Getting any data now Houston? Guess you are. Okay. See you stopped my tape then. I've been running for about 3 extra minutes here to record the check.
02 13 19 45	CC	Roger. We have data now. That was a temporary loss.
02 13 19 55	CDR	What's the matter? Was it chow time down there?
02 13 19 58	CC	Roger. Didn't know you could smell it that far away.

61:19 dump stop over GDS

02 13 20 13	CDR	Give me a call when you're satisfied with the secondary loop; it's stabilized out here pretty well.
02 13 20 18	CC	Wilco, and you might tell Jim that our RTCC is about 4 miles off; we had 20 496.
02 13 20 34	LMP	Fine.
02 13 21 07	CDR	We just put compressor 2 on ac 2.
02 13 22 23	CDR	Houston, Apollo 8. Do you show battery B as voltage dropped some from the postcharge value? Over.
02 13 23 51	CC	Apollo 8, Houston. Confirm that battery B is a little bit lower, and this is attributed to the parasitic loads that are on there.
02 13 24 06	LMP	Okay. I just didn't see the same kind of drop for A. So if you think it's okay, it's fine.
02 13 24 11	CC	That's affirm. You don't have the same parasitic loads on that; B is actually drawing some.
02 13 24 20	LMP	Okay. I guess that's the radiators, huh?
02 13 24 39	CC	Apollo 8, Houston. We've seen enough of the secondary evaporator. We would like for you to wait about 2 minutes between the time you go to RESET and the time you turn the pump off.
02 13 24 53	CDR	I agree; good idea. And we plan to leave the water control in AUTO.
02 13 25 09	CC	Roger.
02 13 31 30	CC	Apollo 8, Houston.

02 13 31 34	CDR	Go ahead, Houston. Apollo 8.
02 13 31 37	CC	Okay. Looking over the - our redundant component check, it appears we have not yet checked the integrity of the secondary loop radiators; and if you haven't done that, some time we would like to open up the secondary radiators but not flow through them and just measure the accumulator pressure.
02 13 32 03	CDR	Stand by.
02 13 32 42	CDR	Houston, we don't show that in our pre-LOI check, but we're willing to go ahead and do it if you want to.
02 13 32 50	CC	Roger. We just noticed that it isn't there, and, yes, we would like to. You understand that we are not proposing that you flow, but merely we check for any pressure decay.
02 13 33 10	CDR	Roger. Wait till I get my trusty assistant here to help me.
02 13 34 20	CDR	Okay, Houston. We're going to blow the secondary, I mean, open the secondary RAD for 30 seconds now.
02 13 34 27	CC	Roger.
02 13 34 38	CDR	Looks pretty good.
02 13 34 40	CC	Sure does.
02 13 35 05	CDR	Okay. They're closed now.
02 13 35 07	CC	Okay. Thank you. Looks good.
02 13 35 11	CDR	Roger. No meteoroids yet.

02 13 38 48	CC	Apollo 8, Houston. You take your tape recorder to stop, and we'll reset it then and give it back to you.
02 13 39 00	CDR	Roger. It's stopped.
02 13 39 02	CC	Thank you.

END OF TAPE

02 13 53 18 CC Apollo 8, Houston.

02 13 53 23 LMP Go ahead.

02 13 53 25 CC Okay. We still need to talk about the REV 2 attitudes we're going to use here to work around the fact that you have a fogged center window. Whenever that's convenient, we'd like to go over what your thoughts are on the subject so we can make sure we can get our flight plan squared away.

02 13 53 47 LMP My thoughts are to make to do with the best with what we have. We are not interested in changing a lot of things right now.

02 13 53 55 CC Okay. The one proposal that sounds like it has some advantage to it: if we let Jim do his evaluation through the telescope, you do everything exactly the same except you turn and roll over 180 degrees so that your head's up, and let Jim do his tracking through the telescope and you'll still be a yaw right when you go to pick up your TV and that type of thing. It looks like that probably will cover everything. We can do that or we can just go as is and just have to let some of that tracking evaluation go by. Another alternate would be to have Jim look out the right-hand rendezvous window, and you may have to change your

attitude in order to get the same picture there also.

02 13 55 08 CDR I think we'll try to do that, but I don't - this is one of the things that we'll work out when we get there.

02 13 55 16 CC Okay. The reason we were looking into it in the flight plan is, if you do want to try rolling over and flying heads up or something of that nature, we can help Bill get a little more out of his photography by giving him some new film settings and that type of thing. We'll have something like that available; in case you do fly heads up, why, we'll have some numbers we can call up for film settings.

02 13 55 45 CDR Thank you.

02 13 57 15 CDR Houston, Apollo 8.

02 13 57 17 CC Go ahead.

02 13 57 22 CDR Roger. We are going to have to dump some urine here shortly. Will this bother your tracking?

02 13 57 42 CC Apollo 8, we're checking on that with the tracking people now.

02 13 58 01 CDR Houston, just give us the time when we can start on it, and we'll hold off until you say so.

02 13 58 06	CC	Okay. And you can anticipate a handover between stations here on the hour, and you might get a slight glitch as we go through. I'll give you a call when we get back.
02 13 58 21	CDR	Thank you, Ken. What station are we going to be going to, Ken?
02 13 58 32	CC	Okay. We'll be going to Honeysuckle.
02 13 58 37	CDR	Thank you.
02 13 59 31	CC	Apollo 8, Houston. You're cleared for a dump at this time, and I understand this is the last gas station for a long time.
02 13 59 42	CDR	You mean you don't want us to dump after this for a while?
02 13 59 45	CC	That's affirm. Due to the tracking as you approach the LOI, they would like to minimize any of these type of perturbations.
02 14 04 06	CC	Apollo 8, Houston through Honeysuckle.
02 14 04 11	LMP	Roger. Houston through Honeysuckle. We read you loud and clear.
02 14 04 15	CC	Okay. Good morning.
02 14 04 20	LMP	Good morning.
02 14 04 23	CC	Thought you went to sleep.
02 14 04 25	LMP	You got over to Australia pretty fast.
02 14 04 30	CC	Roger. Did that gas station call wake you up?
02 14 04 41	LMP	Man, I've been all eyeballs and elbows here for the last several hours.

02 14 04 57	CC	I'll bet. If you've got nothing else to do, I do have two charts in your LOI table that I need to give you some update numbers on.
02 14 05 04	LMP	Stand by.
02 14 05 21	LMP	We'll get our LOI tables man on the line here. Houston. Stand by.
02 14 05 25	CC	Roger.
02 14 06 07	CMP	Okay, Houston, CMP here. I understand you have some updates for me.
02 14 06 12	CC	Yes, sir; I've got a couple of charts in your chart book under LOI, and I have some numbers to fill in, one of them being the chart of LOI DELTA-V magnitude versus abort DELTA-V.
02 14 06 35	CMP	Okay. Stand by, and I'll get it out.
02 14 06 37	CC	Roger.
02 14 07 04	CMP	Okay, I have the chart out. Go ahead.
02 14 07 06	CC	Alright. Mode 1, 5 hours, roll 1.38, pitch 7.89, yaw 357.37; Mode 1, 15 minutes, roll 180.73, pitch 29.46, yaw 1.65. Over.
02 14 08 11	CMP	Roger. The new attitudes for the Mode 1, 5 hour Mode 15 minute are as follows: roll 1.38, pitch 7.89, yaw 357.37; Mode 1, 15 minute, roll 180.73, pitch 29.46, yaw 1.65.
02 14 08 43	CC	Okay. That is correct. Now I also have to give you a couple of points to plot on that curve. The present curve you have drawn is based on a 60-mile perigee or perilune, and you right

now have a 62-mile pericynthian; and the reason that your target is for 62 miles is to pass over the landing site, so I have five sets of coordinates for you to copy.

02 14 09 16	CMP	Is this to go on the same chart to redraw the curve?
02 14 09 19	CC	That is affirmative.
02 14 09 24	CMP	Okay. Go ahead.
02 14 09 27	CC	Okay. We'll go in on the LOI DELTA-V magnitude 1600, abort DELTA-V 2450, two-four-five-zero.
02 14 09 59	CMP	Okay. LOI DELTA-V magnitude 1600, abort DELTA-V 2450. Stand by just one. I have it; continue.
02 14 10 20	CC	Okay. The next one is the LOI DELTA-V 2000, abort DELTA-V 3130.
02 14 10 47	CMP	Roger. I've got that plotted.
02 14 10 51	CC	2400 LOI DELTA-V, abort DELTA-V 3880, three-eight-eight-zero.
02 14 11 18	CMP	I've got it plotted.
02 14 11 20	CC	2800 LOI, abort DELTA-V 4700. Over.
02 14 11 46	CMP	Roger. I have that one plotted, too.
02 14 11 50	CC	Alright. The last one is LOI DELTA-V 2990, abort DELTA-V 5114. That is almost directly into the end of the present curve, 5114.
02 14 12 20	CMP	Say again the LOI DELTA-V magnitude, please.
02 14 12 24	CC	Okay. LOI DELTA-V 2990.

02 14 12 31	CMP	Roger. 2990. Okay. I have it plotted.
02 14 12 49	CC	Alright. And on the next one, you should have a chart (number 10), and we have three numbers to go in there for a Mode 3 gimbal angle.
02 14 13 06	CMP	Roger. Go ahead with the Mode 3 gimbal angles.
02 14 13 12	CC	Roll 180.87, pitch 42.31, yaw 1.65.
02 14 13 36	CMP	Mode 3 gimbal angles are as follows: roll 180.87, pitch 42.31, yaw 1.65.
02 14 13 48	CC	Roger. That is correct.
02 14 13 56	CMP	Could you please send up a French curve for me?
02 14 14 00	CC	Roger.
02 14 14 03	CDR	Send up a couple.
02 14 14 07	CC	The only one I have is about 6 foot.
02 14 14 18	CDR	Houston, could you give us some gimbal angles to point at the moon? I never have seen it the whole trip, and I'm wondering which way it is from us now.
02 14 14 26	CC	Roger. 180.
02 14 16 35	CMP	Houston, Apollo 8. Radio check.
02 14 16 38	CC	Roger. Loud and clear.
02 14 16 42	CMP	Roger.
02 14 16 47	CC	We are getting ready to give you a rundown on your systems. We're going over all the final steps, and we will tell you what we see in